OHIDA BINTE AMIN

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EDUCATION

Northeastern University, Boston, MA, USA *September 2022 - August 2027 (Expected)*
Ph.D. in Personal Health Informatics / Computer Science

Khulna University of Engineering & Technology, Bangladesh *March 2016 - March 2020*
B.Sc. (Engg.) in Computer Science and Engineering

EXPERIENCE

Khoury College of Computer Sciences, Northeastern University *September 2022 - Present*
Graduate Assistant (PhD Candidate) at The SATH Lab

- Building in-the-wild stress prediction models by integrating mined behavioral rules from passive sensing data with physiological biomarkers from **pre-trained SVM model** on lab stressors, applying interpretable rules as predictors in **AdaBoost** model across temporal windows, achieved performance with ROC-AUC of **78.75%**.
- Exploring how **in-the-wild stress phenotypes** influence stress recovery by applying longitudinal clustering **KML, KML3D** to extract behavioral and passive-sensing phenotypes, which reduced recovery prediction error by **29.4%** in linear regression models.
- Conducted a controlled digital phenotyping stress study across research and consumer-grade wearables, applying **SVM with RBF kernel** (C=107, γ=0.001) and **RF** with 100 trees under LOSO validation, Garmin Forerunner 55s achieved highest performance, outperforming Empatica E4 by **6.2%**.
- Analyzed stress–sleep relationships using **ANOVA** and **linear mixed-effects models**, revealing greater multiday sleep efficiency variability among high-stress individuals, addressing gaps in capturing different social determinants in sleep analysis.
- Investigated social interaction patterns and depression severity using digital phenotyping data, applying **constrained K-means clustering** on personality traits and **trajectory modeling** of daily behavioral patterns.

Samsung Research America *May 2024 – August 2024*
Data Science & Machine Learning Intern at Samsung Design Innovation Center

- Designed methods to aggregate and analyze unstructured response data for dyslexia support, using **TextBlob** for sentiment analysis and **TF–IDF vectorization** for text feature extraction.
- Built an **MLP** model to predict personalized support needed for Dyslexic individuals with smartphones for developing a prototype with **Streamlit** framework.

Baylor College of Medicine, Rice University *April 2021 - December 2021*
Research Fellow at The Fatima Al-Fihri Predoctoral Fellowship

- Worked on automatic annotation of 3D genomic datasets using unsupervised/self-supervised deep learning approaches.
- Conducted comparative study with different clustering Techniques including **K-means** and **DBSCAN** on HiC features.

Robi Axiata Limited, Dhaka, Bangladesh *July 2020 - February 2022*
Specialist, Data Science & Machine Learning

- Complaint classifier ML model development with a **neural network** with ReLU and Softmax layers, training, validation & deployment for resolving customer complaints with zero human intervention.
- Linear regression-based predictive model for suggesting suitable offers to the customers (like recharge, data pack, etc.) development, training, & validation.

Abelling, Dhaka, Bangladesh *June 2020 - July 2020*
Machine Learning Intern

- Creating documentation for ML products and reviewing AI-assisted data labeling APIs.
- Abelling client data analysis by applying **statistical analysis**.

SKILLS

Language	Python, C, C++, R, Shell, Swift, PL/SQL
Frameworks/Tools	TensorFlow, Keras, Scikit-learn, PySpark, Pandas, NumPy, Matplotlib, Plotly, Oracle DBMS, MySQL, PyMongo, StatsModels, DEAP, Streamlit, Flask, Odoo, SkFuzzy, MATLAB Fuzzy Toolbox, KML, KML3D (R), OpenAI API
Domain	Machine Learning, Deep Learning, Digital Phenotyping, Digital Biomarkers, Mobile Sensing, Signal Processing, Data Science, Natural Language Processing, Human Computer Interaction
Wearable/Medical Devices	Empatica E4, Garmin, Polar Chest Straps, Biopac MP160 System

IN-PROGRESS PAPERS & PATENT

- V. Singh, N. Miner, Y.R. Vutukoori, **O.B. Amin**, M. Chiu, C. Myers, C. Harteveld, R. Lohre, C. Bono, and A. Sathyanarayana, ***"Automated Functional Assessment of Shoulder Pathologies Using Machine Learning and Extended Reality,"*** submitted in npj Digital Medicine
- **O.B. Amin**, V. Mishra, H.Saksono, R. Ghosal, and A. Sathyanarayana, ***"Predicting Recovery Time from In-Lab Stressors using Digital Phenotyping,"*** submitted to ICHI'26
- A. Sathyanarayana, J. An, **O.B. Amin**, and J.-P. Onnela, ***"Examining the use of consumer wearable devices and digital tools for stress measurement in college students: a systematic review of methods,"*** submitted in JMIR mHealth and uHealth
- **U.S. Provisional Patent** Application No. 63/665,243 **Incorporating Personality Traits to Digitally Phenotype Mental Health** Inventors: **Ohida Binte Amin**, Aarti Sathyanarayana, Varun Mishra NU Reference No.: INV-24121 Status: Filed, Pending

SELECTED PUBLICATIONS

Google Scholar Profile

- **O.B. Amin**, T.M. Tapera, R. Volpe, V. Mishra, and A. Sathyanarayana ***"Extending Stress Detection Reproducibility to Consumer Wearable Sensors,"*** in 2025 47th International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC) **IEEE**, 2025. [Paper Link]
- **O.B. Amin**, V. Mishra, and A. Sathyanarayana, ***"The Impact of Stress and Sleep: Capturing Multi-day Patterns,"*** in 2024 38th Annual Meeting of SLEEP, vol. 47, issue supplement1, 2024. [Abstract Link]
- **O.B. Amin**, V. Mishra, and A. Sathyanarayana, ***"Investigating Social Interaction Patterns with Depression Severity across Different Personality Traits Using Digital Phenotyping,"*** in 2023 11th International Conference on Affective Computing and Intelligent Interaction Workshops and Demos (ACIIW). **IEEE**, 2023. [Paper Link]

AWARDS & ACHIEVEMENTS

- **SRS Diversity Membership Award 2023 – Sleep Research Society**
- **Start-Up Fund Recipient – Northeastern University, Khoury College of Computer Sciences**
- **Selected Research Fellow – The Fatima Al-Fihri Predoctoral Fellowship 2021**
- **Speaker Grant — PyCon US 2020, 2022 — Python Software Foundation**

RELEVANT COURSES

Personal Health Interface Design and Development, Information Visualization Theory and Application, Mobile Application Development, AI for Human Computer Interaction, Understanding Users, Evaluating Health Technologies, Biostatistics in Public Health

TEACHING ASSISTANTSHIP

CS 5200: Database Management Systems (Prof. Martin Schedlbauer)